103

Clarion Co., Ltd.
Export Division— 22-3, Shibuya 2-chome, Shibuya-ku, Tokyo, 150 Japan
Tel: 03-400-1121 Fax: 03-400-8679 Telex: J22908, J22152
Service Dept.— 50 Kamitoda, Toda-shi, Saitama, 335 Japan Tel: 0484-43-1111 Telex: J2962628 CLAFAC-J

Clarion

Service Manual

1
2
3
4
5
6
1080
SEEK
Clarion
VF
BD
PU

Model 900TX (GT-826E)

■ SPECIFICATIONS:

Circuit system:	Superheterodyne
Tuning system:	Electronic tuning
Receving frequency:	LW 155kHz to 281kHz MW 522kHz to 1611kHz UKW(FM) 87.5MHz to 108MHz
Intermediate frequency:	LW,MW 459kHz UKW(FM) 10.7MHz
Power supply voltage:	DC 14.4V (10.8V to 15.6V) Negative ground
Power consumption:	Less than 400mA
Dimensions:	Width 178mm Height 25mm Depth 160mm
Weight:	700g

■ COMPONENTS:

GT-826E-51
Main unit 1

Mounting bracket	300-5946-02	1
Mounting bracket	300-5946-03	1
Parts bag	921-8207-00	1
Tap screw (M5 × 20)	700-5020-80	2
Special screw (M5 × 8)	716-0673-00	4
Plate nut	725-0216-00	2
Parts bag	922-1461-00	1
Escutcheon	370-3961-00	1

■ FEATURES:

- FM – MPX/MW/LW PLL synthesizer tuner
- 2-way seek (Up/Down) & manual tuning (Up/ Down)
- Auto motor stop by DK input
- Auto VF retune
- Remort control lead for seek

103

■ ADJUSTMENT:

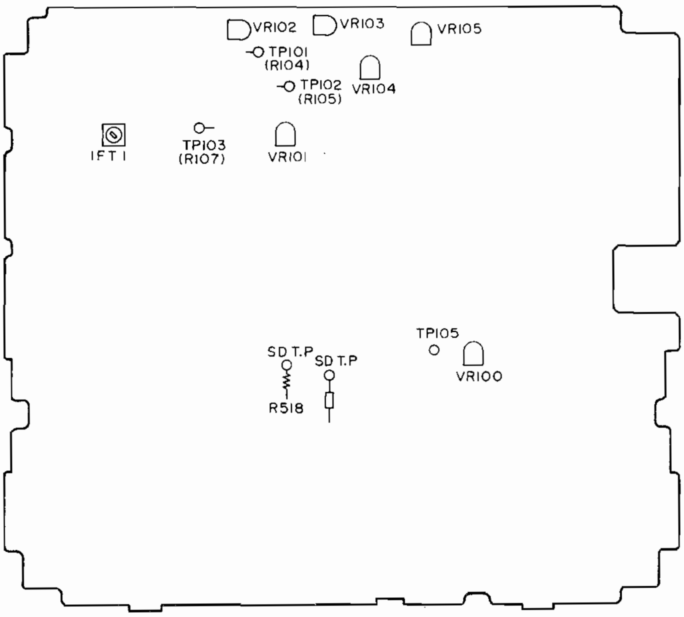
[CAUTION]
All adjustment should be made at room temperature.

Adjustment item	Adjustment point	Procedure
UKW		1. Connect the Antenna receptacle to 98.0 MHz (98.000 MHz), 400 Hz, 100% modulation, 65 dB SSG signal. 2. Connect the distortion meter and VTVM. 3. Tune at 98.0 MHz (98.000 MHz). 4. Connect TP 103 to Ground (Lower case). 5. Check VR 101 is mechanical center. 6. Adjust IFT 102 so that output of the distortion meter is minimum. 7. Connect the DC volt meter between TP 101 and TP 102, and adjust VR 101 so that output is 0±50 mV. 8. Change SSG modulation to 30% and ouput to 7 dB. 9. Adjust IFT 1 (FM TUNER PACK) to obtain a maximum output.
Stop seek sensitivity	VR 101	1. Tune at 98.0 MHz (98.000 MHz), input a 25 dB non-modulated SSG signal. 2. Adjust VR 101 so that the voitage of R 518 is in the range 0 V to 5 V.
SASC	VR 103	1. Tune at 98.0 MHz (98.000 MHz), input an 55 dB, 7 kHz modulation frequency, 30% modulation degree SSG signal, and then turn on ST. SW. 2. Adjust the output level of the volume controller to 0 dBm (0.775 V). 3. Set the SSG output to 40 dB and adjust VR 103 so that the output level is −3 dBm.
MPX Pilot canceller	VR 105	1. Tune at 98.0 MHz (98.000 MHZ), input a 55 dB, modulation (PL 10%). 2. Adjust VR 105 so that output of the set is minimum.
Separation	VR 104	1. Tune at 98.0 MHz (98.000 MHz), connect the output of a stereo modulator to the external modulation terminal, and input a 65 dB SSG signal. 2. Set the stereo modulator to the L or R ch and adjust VR 104 so that the maximum separation is obtained.
DK VCO	VR 100	1. Tune at 98.0 MHz (98.000 MHz), input a 55 dB non-modulated SSG signal, and turn on VF. SW. 2. Connect the frequency counter to TP 105 through a 22 kΩ resistor and adjust VR 100 so that the counter indicates 125 Hz. In the case, 25 sec. later, seeking occurs.

[NOTE] After the adjustment of frequency range, be sure that:
(1) Band edge frequency of LW shall be 148.5 kHz −20 kHz
(2) Band edge frequency of UKW shall be 87.5 MHz +100 kHz
−160 kHz
at low end. And shall be lower than 108.16 MHz at upper end.

• SPECIFICATION — LIMIT —	Quieting sensitivity:	MW Less than 33 dB (at 20 dB s/n) LW Less than 40 dB (at 20 dB s/n) UKW Less than 12 dB (at 30 dB s/n)
	Stereo separation:	UKW More than 20 dB

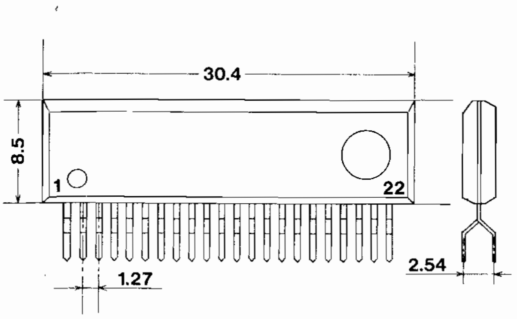
ADJUSTMENT POINT



■EXPLANATION OF IC's:

■LA2220 051-0739-00 ARI System SK TYPE
(Tentative Standard)

Figure



Functions

(1) SK operation	LED display through AND using 57kHz (SK) and 23.75 to 53.98Hz (BK). Voice output control (Muting) through AND using above frequencies.
(2) MUTING SW	When Pin 4 is set to GND, signal is put in the through mode regardless existence of SK and BK. LED display is available in the SK and BK operations.
(3) OSC-STOP SW	When voltage (5V to Vcc −1.4V) is applied to Pin 20, the oscillating circuit stops and signal is put in the through mode. (LED turns OFF).
(4) DK and BK output	The system contains a 57kHz AM detect circuit to send DK and BK signals. In the OSC-STOP mode, the system stops detect operation.
(5) SK-STOP	When frequency of 57kHz (SK) exists, voltage at Pin 16 turns LOW. This function is used as the STOP signal in the auto search mode. (When 57kHz (SK) exists: V16=0V) (When 57kHz (SK) does not exist: V16=3.6V)
(6) Turn-ON level control	When voltage is applied to Pin 17, 57kHz (SK) detect level goes upward. This function is used to prevent LEDs from turning ON with weak signals.

Feature

(1) The system uses 456kHz ceramic oscillator and 57kHz BPF, which have materialized no need of adjustment of the freerun frequency and coil. *
(2) The system contains BK signal detect circuit displaying with LED in the AND operations of SK and BK, in order to prevent malfunction when RDS (or PJ system) is received.
(3) Turn-ON level may be altered by changing C.R installed outside the BPF.
(4) Only SK can be detected in the auto search mode (through SK-STOP terminal at Pin 16).
(5) Turn-ON level may be raised by applying DC voltage (through VL-CONT terminal at Pin 17).

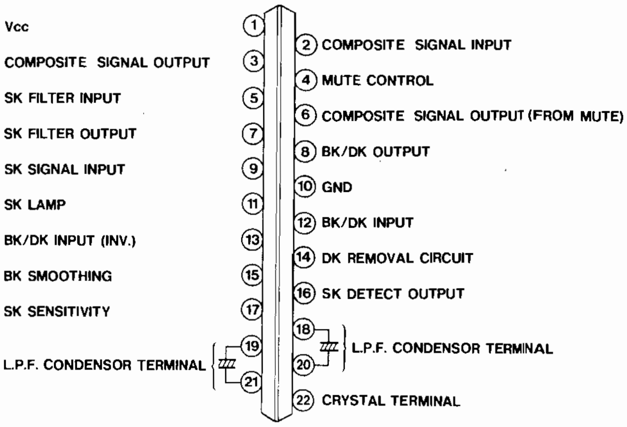
Absolute Maximum Ratings (Ta=25°C)

Supply Voltage	Vcc	V_{1-10}	16V
		V_{1-11}	16V
Input Current	Id		1mA
Lamp Drive Current	I_D		30mA
Power Dissipation	P_D		574mW

Electrical Characteristics (Ta=25°C, Vcc=8V, Vin=200mV, L+R=85%, 19kHz=10%, 57kHz=5%, f=1kHz)

Item	Symbol	Condition	SPEC.			Unit
			MIN	TYP.	MAX.	
Non-signal current	Icco		17	24	34	mA
Input resistance	r_i		—	40k	—	Ω
SK detect level	V_{SK}	f=57kHz, Input Pin 2	2.5	3.6	5.5	mV
SK Hysteresis	$h_{/SK}$	f=57kHz, Input Pin 2	—	5.5	—	dB
BK detect level	V_{BK}	f=23.75Hz, Input Pin 12	—	17	—	mV
BK hysteresis	$h_{/BK}$	f=23.75Hz, Input Pin 12	—	3	—	dB
Capture range	C.R.	f=57kHz, V_{IN}=10mV	—	±1 2	—	%
Output level	V_{OAF}	f=1kHz, V_{IN}=200mV	147	210	294	mV
DK output level	V_{ODK}	f=57kHz, V_{IN}=10mV, 125Hz, 30%mod.	27	38	54	mV
Total harmonic distortion	THD	f=1kHz, V_{IN}=200mV	—	0 13	0 5	%
Signal attenuation degree	MUTE	f=1kHz, V_{IN}=200mV, DIN/AUDIO filter	−60	−75	—	dB
Free-run frequency	Fo	Pin2 : C=GND at CSB456F11(TYP)	451	454.8	458 5	kHz

Terminal Connection



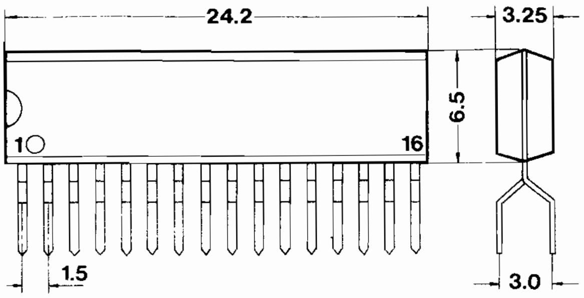
No.	Name of terminal	Function
1	Vcc	Supply terminal. The recommended voltage is 8V.
2	COMPOSITE SIGNAL INPUT	Input of a composite signal.
3	COMPOSITE SIGNAL OUTPUT	Output of a composite signal amplified in the IC.
4	MUTE CONTROL	When no BK/DK signal exists with this terminal set to OPEN, mute is applied to the composite signal output at Pin 6. When this terminal is set to GND, no mute operation is performed.
5	SK FILTER INPUT	Input terminal of filter amplifier for SK signal detection.
6	COMPOSITE SIGNAL OUT (FROM MUTE)	Muting output terminal of composite signal (See description on Pin 4).
7	SK FILTER OUTPUT	Output terminal of filter amplifier for SK signal detection.
8	BK/DK OUTPUT	Output of SK signal detected in the AM mode.
9	SK SIGNAL INPUT	Receives SK signal separated from composite signal.
10	GND	For grounding.
11	SK LAMP	Turns a lamp on when SK and BK signals are detected simultaneously.
12	BK/DK INPUT	Receives BK and DK signals.
·13	BK/DK INPUT (INV.)	Inverted input terminal of BK and DK signals. Normally not used.
14	DK removal terminal	Connects L.P.F. condensor to reject DK signal.
15	BK smoothing	Connects L.P.F. condensor to smooth a rectified BK signal.
16	SK DETECT OUTPUT	Sends "High" when SK signal exists.
17	SK SENSITIVITY	Normally set to OPEN. When voltage is applied, SK signal detect sensitivity drops.
18 ⁞ 21	L.P.F condensor terminal	Terminal used to connect a condensor constituting L.P.F. When DC voltage of 5V to Vcc −1.4V is applied to Pin 20, V.C.O. stops.
22	Crystal terminal	Connects crystal or ceramic resonator.

■ LA 3430 051-0733-01 FM MPX (Tentative Standard)

Feature

FM stereo multiplexer built in functions as pilot canceller, stereo noise controller, high frequency cut controller and automatic changer between stereo and monaural.

Figure


24.2
3.25
6.5
1
16
1.5
3.0

Absolute Maximum Ratings (Ta=25°C)

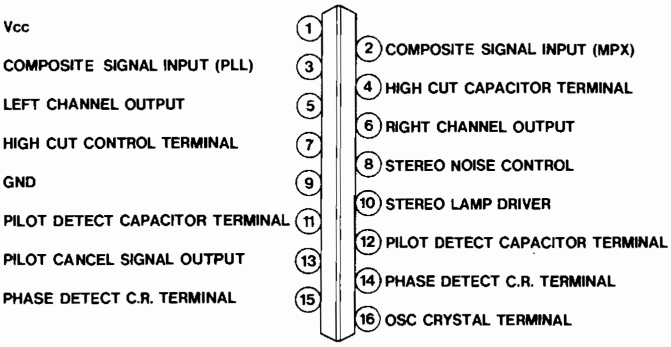
Supply Voltage	Vcc	16V
Lamp Drive Current	I_D	30mA
Power Dissipation	P_D	520mW

Electrical Characteristics

(Ta=25°C, Vcc=10V, Vi=300mV, f=1kHz, L+R=90%, PILOT=10%)

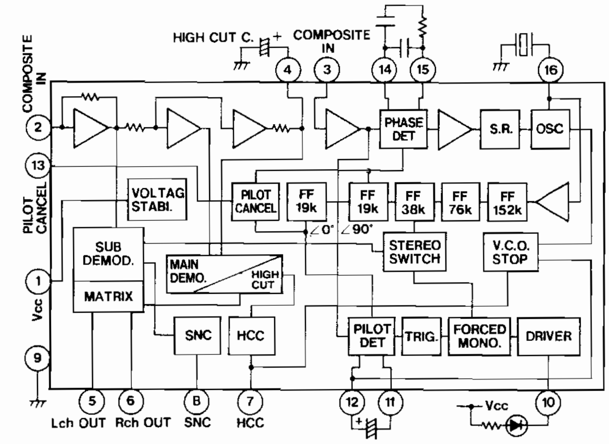
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Non-signal current	Icco	No input		28	38	mA
Channel separation	Sep		40	50		dB
Total harmonic distortion	THD	Monaural		0.07	0.2	%
		Main		0.07	0.2	%
Lamp turn-ON level	V_L	L+R=90%, PILOT=10%	60	85	120	mV
Lamp hysteresis	hy			3	6	dB
Capture range	CR			±1		%
Output signal level	Vo	sub	150	215	300	mV
Signal/noise ratio	S/N	Rg=20kΩ	68	74		dB
		Rg=10kΩ	70	78		dB
Input resistance (Pin 2)	ri			20		kΩ
SCA reject ratio	SCArej			80		dB
Allowable input voltage	Vi	THD=1% Rg=20kΩ	700	900		mV
		THD=1% Rg=10kΩ		450		mV
SNC output attenuation degree	Att SNC	V8=0.6V L−R=90%, PILOT=10%	−8.5	−3.0	−0.3	dB
SNC output voltage	Vo sub	V8=0.1V, L−R=90%, PILOT=10%			5	mV
HCC output attenuation degree	Att HCC(1)	V7=0.6V, L+R=90%, PILOT=10%	−15.0	−6.0	−0.5	dB
	Att HCC(2)	V7=1V, L+R=90%, PILOT=10%	−2.0		0	dB
Supply voltage ripple rejection	Rr			35		dB
VCC STOP voltage				7.3		V
Channel balance				0.5	1.5	dB
Pilot cancelling degree			20	27		dB
Stereo amplifier current		Minimum stereo operating current	1.0			mA
Saturation voltage (Pin 10)		I_L=10mA		1.0		V

Terminal Connection


Vcc ①
COMPOSITE SIGNAL INPUT (MPX) ②
COMPOSITE SIGNAL INPUT (PLL) ③
HIGH CUT CAPACITOR TERMINAL ④
LEFT CHANNEL OUTPUT ⑤
RIGHT CHANNEL OUTPUT ⑥
HIGH CUT CONTROL TERMINAL ⑦
STEREO NOISE CONTROL ⑧
GND ⑨
STEREO LAMP DRIVER ⑩
PILOT DETECT CAPACITOR TERMINAL ⑪
PILOT DETECT CAPACITOR TERMINAL ⑫
PILOT CANCEL SIGNAL OUTPUT ⑬
PHASE DETECT C.R. TERMINAL ⑭
PHASE DETECT C.R. TERMINAL ⑮
OSC CRYSTAL TERMINAL ⑯

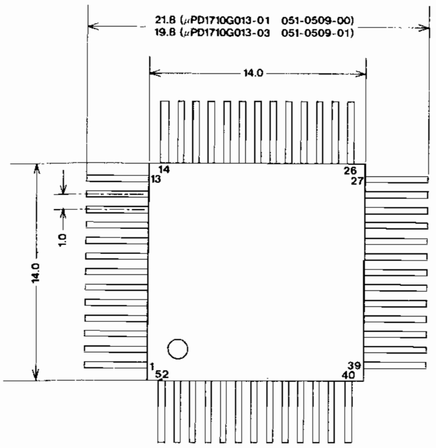
No.	Name of terminal	Function
1	Vcc	Connected to power supply.
2	Composite signal input (MPX)	Composite signal input terminal to MPX unit.
3	Composite signal input (PLL)	Composite signal input terminal to PLL unit.
4	High-cut condensor terminal	Connects a condensor to improve S/N ratio on audio sensitivity by attenuating high-pass of voice signal in the weak electric field.
5	Left channel output	Generates voice signal in the left channel.
6	Right channel output	Generates voice signal in the right channel.
7	High-cut control (HCC)	When voltage applied to this terminal is dropped down to about 1.0V or less (when Vcc=10V), 7kHz or more of the main signal (Monaural signal) is dropped, so that S/N ratio for the audio sensitivity may be improved. When voltage of 7V or more is applied to this terminal, V.C.O. oscillation is stopped, putting the system in the forcible monaural mode. In this case, HCC and SNC become not operatable.
8	Stereo noise control (SNC)	As voltage applied to this terminal is decreased gradually, output of SUB DETECTOR (differential signal) drops gradually, so that the voice signal output is put nearly in the monaural mode, providing the favourable S/N ratio in the weak electric field.
9	GND	For grounding
10	Stereo lamp driver	Absorbs the stereo lamp drive current of up to 30mA.
11 12	Pilot detect condensor terminal	Connects a condensor for detection of the pilot signal.
13	Pilot cancel signal output	Generates a faulse triangular wave of 19kHz to cancel the pilot signal.
14 15	Phase detect C.R. terminal	Connects C.R. for phase detection.
16	OSC CRYSTAL terminal	Connects a oscillating crystal or ceramic resonator.

Block Diagram


HIGH CUT C.
COMPOSITE IN
COMPOSITE IN
PILOT CANCEL
Vcc
PHASE DET
S.R.
OSC
VOLTAG STABI.
PILOT CANCEL
FF 19k
FF 19k
FF 38k
FF 76k
FF 152k
∠0°
∠90°
SUB DEMOD.
MATRIX
MAIN DEMO.
HIGH CUT
STEREO SWITCH
V.C.O. STOP
SNC
HCC
PILOT DET
TRIG.
FORCED MONO.
DRIVER
Lch OUT
Rch OUT
SNC
HCC
Vcc
1
2
3
4
5
6
8
7
9
10
11
12
13
14
15
16

■ μPD 1710G-013-01 051-0509-00 ■ μPD 1710G-013-03 051-0509-01 Tuner Controller

I. Figure


21.8 (μPD1710G013-01 051-0509-00)
19.8 (μPD1710G013-03 051-0509-01)
14.0
14.0
1.0
14
13
26
27
1
52
39
40

II. Maximum Ratings

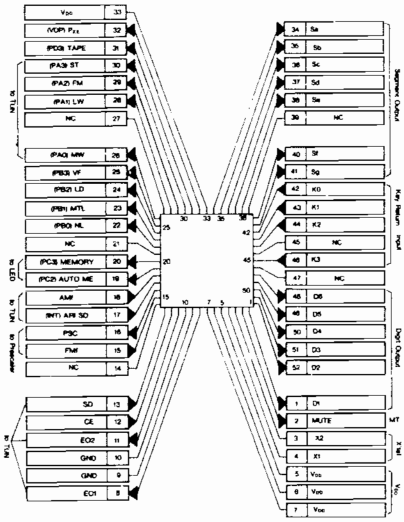
Power voltage	V_{DD}	6.0V
Input voltage		$-0.3V \sim V_{DD}$

III. Receiving Frequency

Band	Frequency range	Channel space (auto)	Channel space (manual)	Reference frequency	Intermediate frequency
FM	87.50 ~ 108.00MHz	50kHz	25kHz	25kHz	10 700, 10.725MHz
MW	522 ~ 1,611kHz	9kHz	9kHz	9kHz	450, 459kHz
LW1	155 ~ 281kHz	9kHz	1kHz	1kHz	450, 459kHz
LW2	153 ~ 279kHz	9kHz	1kHz	1kHz	450, 459kHz

Table-1

IV. Terminal Structure



Terminal Description

No.	Symbol	Terminal name	Function
1, 48 ~ 52	D1 ~ D6	Digit Output	Digit signal output indicated
2	MUTE	Mute Signal Output	Output terminal to erase a shock noise occuring when the lock of PLL is removed It outputs a low signal in the mute ON state
3, 4	X1, X2	X'tal	Terminal for connecting an crystal resonator (4 5MHz)
5, 6, 7, 33	V_{DD}	Power Supply	Supply voltage of 5V ± 10% when the device functions Moreover, in the backup state, the voltage can be dropped into 3 0V (Pins 7 and 33 is internally connected, however, other pins form other circuits to which V_{DD} voltage should be applied)
8, 11	EO1, EO2	Error Out	PLL error output When divided oscillating frequency is higher than the reference frequency, a high level signal is output from these terminals, when lower, a low level signal is output When both frequencies are matched, floating occurs Same signals are output from EO1 and EO2 at the same time
9, 10	GND		
12	CE	Chip Enable	When the device is used in the normal manner, set the signal into the high level. When the device is not used, set it into the low level. (Backup state is obtained in the low state)
13	SD	Station Detector Input	Terminal for inputing a stop signal in the auto tuning state. Auto tuning stops when a high signal is input
15	FMf	Pulse swallow type oscillating input	An output signal from the FM local oscillator (VCO) which is divided into 1/16 or 1/17 with μPB553AC is input Permittable frequency for input is 0 5 to 8.8MHz
16	PSC	Prescaler Control Output	Terminal for outputing a dividing ratio selectable signal, connected to the PSC terminal of μPB553AC As dividing ratio, 16 and 17 can be selected.
17	ARI SD	ARI/STEREO SD Input	In the ARI auto search state, when this terminal is set to the low level after SD (Pin 13) is set to the high level, searching stops.
18	AMf	AM oscillating Input	Input a local oscillating (VCO) of AM (MW, and LW). Permissible frequency for input is 0.5 to 2.5MHz.
19	AUTO ME	AUTO MEMORY	Output a high level signal in the auto memory state.
20	ME	MEMORY	Output a high level signal in the memory write state
22	NL	Noise Limiter Output	Invert an output signal whenever depressing the NL SW (momentary key switch 16)
23	MTL	METAL/NORMAL Output	Inverted whenever the METAL/NORMAL switch (momentary key switch 15) is depressed in the tape running state
24	LD	Loudness Control Output	Inverted whenever the loudness ON/OFF switch (momentary key switch 14) is depressed
25	VF	VF Output	When the ARI indication lights up, a high level signal is output; otherwise, a low level signal is output.
26	MW	MW BAND Output	Output a high level signal when MW is received.
28	LW	LW BAND Output	Output a high level signal when LW is received.
29	FM	FM BAND Output	Output a high level signal when FM is received
30	ST	STEREO/MONORAL Output	Inverted whenever the STEREO/MONO switch (momentary key switch 18) is depressed
31	TAPE	TAPE MODE Input	Input a high level signal when a tape is loaded
32	PEE	PEE	Output a 30ms high level signal when the key is accepted
34 ~ 38, 40, 41	Sa ~ Sg	Segment Output	Terminal for outputing an indicated segument signal, forming a key matrix together with K0 to K3
42 ~ 44, 46	K0 ~ K3	Key Return Signal Inputs	Key return signal input terminal from the external key matrix, forming a key matrix together with Sa to Sg

Table-2

V. Switch Matrix (Key Matrix)

§ 1 Diode SW and alternate SW

		1 Pin	52 Pin	41 Pin
		D1	D2	Sg
42 Pin	K0	BAND CHANGE 2 4	IF3 8	—
43 Pin	K1	BAND CHANGE 1 3	CHANNEL DISPLAY 7	—
44 Pin	K2	LW MODE 2	ARI MODE 6	—
45 Pin	K3	LW SELECT 1	IF1 5	DIMMER ON/OFF
		Diode SW	Diode SW	Alternate SW

Table-3

(1) Diode SW

These switches are set by shortcircuiting or opening an intersection on the matrix by the use of a diode

In the following description, OFF and ON respectively mean open and shortcircuit.

Note that this diode switch is read only when the V_{DD} terminal is initially powered and the CE terminal is changed from "low" to "high", otherwise, the switch is ignorad.

<table>
<tr><th>No</th><th>Switch name</th><th>Description</th></tr>
<tr><td>1</td><td>LW SELECT</td><td>LW band can be used with this switch turned ON, otherwise, it cannot be used.</td></tr>
<tr><td>2</td><td>LW MODE</td><td>With this switch turned ON, LW1 band is selected and with it turned OFF, LW2 band is selected (Refer to Table-1)</td></tr>
<tr><td>3
4</td><td>BAND CHANGE 1
BAND CHANGE 2</td><td>These 2 dioda switches decide the positions of the alternate SW for selecting the band number and band selection as shown in the following table
<table>
<tr><th></th><th>BAND CHANGE 1</th><th>BAND CHANGE 2</th><th colspan="3">Alternate SW used for band selection</th><th>Receiving band</th></tr>
<tr><td>i</td><td>OFF</td><td>ON</td><td>BAND 20</td><td>LW 21</td><td>MW 22</td><td>FM1 FM2, FM3
MW LW</td></tr>
<tr><td>ii</td><td>OFF</td><td>OFF</td><td>BAND 20</td><td>LW 21</td><td>MW 22</td><td>FM1
MW LW</td></tr>
<tr><td>iii</td><td>ON</td><td>OFF</td><td>BAND 20</td><td></td><td></td><td>FM1
MW LW</td></tr>
</table>
Table-4-1
Whenever the BAND key is depressed in (i) to (iii) above, the following function is activated
(i) Mode is changed in the order of →FM1 →FM2 →FM3
(ii) FM1 is selected
(iii) Mode is changed in the order of →FM1 →MW →LW</td></tr>
<tr><td>5</td><td>IF 1</td><td>Select IF of FM OFF 10 700MHz
ON 10 725MHz</td></tr>
<tr><td>6</td><td>ARI MODE</td><td>Select whether or not ARI mode is used
<table>
<tr><td>OFF</td><td>ARI mode, which causes the indication of the radio section to light up even if a tape is loaded and accepts the key of the radio section</td></tr>
<tr><td>ON</td><td>Non ARI mode, which causes the indication of the radio section not to light up when a tape is loaded and does not accept the key operation</td></tr>
</table>
Table-4-2</td></tr>
<tr><td>7</td><td>CHANNEL DISPLAY</td><td>Select the indicating mode of the preset channel OFF . Numerical indication
ON Dot indication</td></tr>
<tr><td>8</td><td>IF 3</td><td>Select an IF of MW and LW OFF 459kHz
ON 450kHz</td></tr>
</table>

Table-4

(2) Alternate SW

By turning on the DIMMER ON/OFF switch, the brightness of lighting becomes about 1/5 times of standard brightness

§ 2 Momentary SW

Whenever the momentary switch is depressed, another key operation cannot be accepted as long as all keys are not released.

		34 Pin	35 Pin	36 Pin	37 Pin	38 Pin	40 Pin
		Sa	Sb	Sc	Sd	Se	Sf
42 Pin	K0	AUTO MEMORY 4	M6 8	M4 12	NOISE LIMITER 16	STEREO MONO 18	MW 21
43 Pin	K1	SCAN 3	M5 7	M3 11	METAL NORMAL 15	MEMORY 17	LW 20
44 Pin	K2	AUTO DOWN 2	MANUAL DOWN 6	M2 10	Loudness Control 14		
46 Pin	K3	SEEK (AUTO UP) 1	MANUAL UP 5	M1 9	VF (ARI) 13		BAND 19

Table-5 Momentary switch

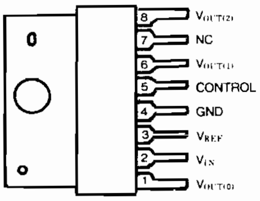
No.	Switch name	Description
1 2	AUTO UP AUTO DOWN	By depressing this switch, a station is continuingly searched downward or upward and when the Sd terminal (Pin 37) is set to "high", the corresponding frequency is held. By depressing the switch twice, auto-tuning stops.
3	SCAN	By depressing this switch, a station is continuingly searched upward and when the Sd terminal is set to "high", another station is continuingly searched after the former station is received for 5 sec. Depressing this switch once again causes to stop the SCAN function.
4	AUTO MEMORY	By depressing the (MEMORY ⑰), (ME) lights up for about 5 sec. during which depress this AUTO MEMORY switch. At the time, the AUTD MEMORY lamp lights up and a broadcasting station is detected and memoried from the existing receiving frequency to higher frequency. When the receiving frequency is memorized by the presetting, the following memories are sequentielly memorized; otherwise, mamory is performed from M1 in sequence. The writing operation is terminated when the upper limit of a band comes in or M6 is written. Next, after M1 is called, (AUTO MEMORY) lamp does not light up and the sequential operation is terminated When canceling this mode in the mid-operation, depress this switch once again.
5 6	MANUAL UP MANUAL DOWN	Used for manual tuning. Whenever this switch is depressed, one step of frequency is stepped up/down. When this switch is depressed for 0.5 sec. or more, fast forward tuning is performed continuously until the switch is released.
7 ι 12	M1 ι M6	Since the switches of preset channels independently accord with FM1, FM2, FM3, LW, and MW, then max 30 stations can be memorized. By depressing this switch only, the required frequency is called and the corresponding station is received. When memorizing a frequency by means of this switch, first depress the (MEMORY ⑰) switch and then depress this switch while (ME) lamp lights up (for about 5 sec). Moreover, in the power on state, in all the preset memories, the lower limit frequency of each band is set.
13	ARI	When (ARI MODE) of the diode switch No. 8 is in the off state, ARI indication and VF OUT (Pin 25) are inverted whenever this switch is depressed At the time, a high level signal and low level signal are output when the ARI indication lights up and puts off, respectively. While the ARI indication lights up, by depressing AUTO UP or AUTO DOWN, automatic ARI (stereo) search is available.
14	Loudness Control	Ref. Table-2, No. 24
15	METAL NORMAL	Ref. Table-2, No. 23
16	NOISE LIMITER	Ref. Table-2, No. 22
17	MEMORY	Ref Table-8, No 4, 7~12
18	STEREO MONO	Ref. Table-2, No. 30
19	BANO	Ref. Table-4, No. 3~4
20	LW	
21	MW	

Table-6

■MB3756 051-0526-00 Constant-voltage Source

MB3756 is an monolithic integrated circuit for a constant-voltage power source. It has 3 output terminals. With these 3 output terminals, it is possible to obtain the stabilized output of an alternate changeover function by an external control signal. Noises, which tend to be generated by changeover, is prevented by an internal circuit, thus making easy the changeover of transmission/reception and AM/FM in CB.

Terminal Layout (Top View)



Maximum Ratings ($T_A=25°C$)

Item	Symbol	Rating	Unit
Supply voltage	V_{IN}	18	V
Power dissipation	P_D	1 *	W
		4 * *	W
Operating temperature	T_{OP}	−20~+75	°C
Storage temperature	Tstg	−55~+125	°C

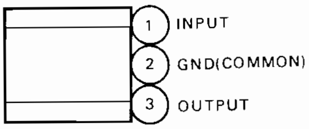
*	No Heat Sink	$T_A \leqq 70°C$
* *	Infinite Heat Sink	$T_C \leqq 70°C$

Electric Characteristics ($T_A=25°C$, $V_{IN}=14V$, $R_{L0}=R_{L1}=200\Omega$, $R_{L2}=100\Omega$)

Item	Symbol	Condition	Min	Typ	Max	Unit
Bias current	I_B	$V_{IN}=18V$	–	6	10	mA
Ripple suppression		f=100Hz	–	60	–	dB
Output noise voltage		10Hz≦f=100kHz, $C_R=10\mu F$	–	40	–	μV
Min. I/O voltage difference	$V_{IN}-V_O$		–	1.7	–	V
Output voltage	$V_{O1(L)}$	$V_{IC}=0.8V$	0	–	0.2	V
(control input at L level)	$V_{O2(L)}$	$V_{IC}=0.8V$	7.8	8.2	8.6	V
Output voltage	$V_{O1(H)}$	$V_{IC}=2.0V$	7.8	8.2	8.6	V
(control input at H level)	$V_{O2(H)}$	$V_{IC}=2.0V$	0	–	0.2	V

■TA78L006AP 051-0296-01 3 Termina Voltage Re ulater (6)

Terminal Construction



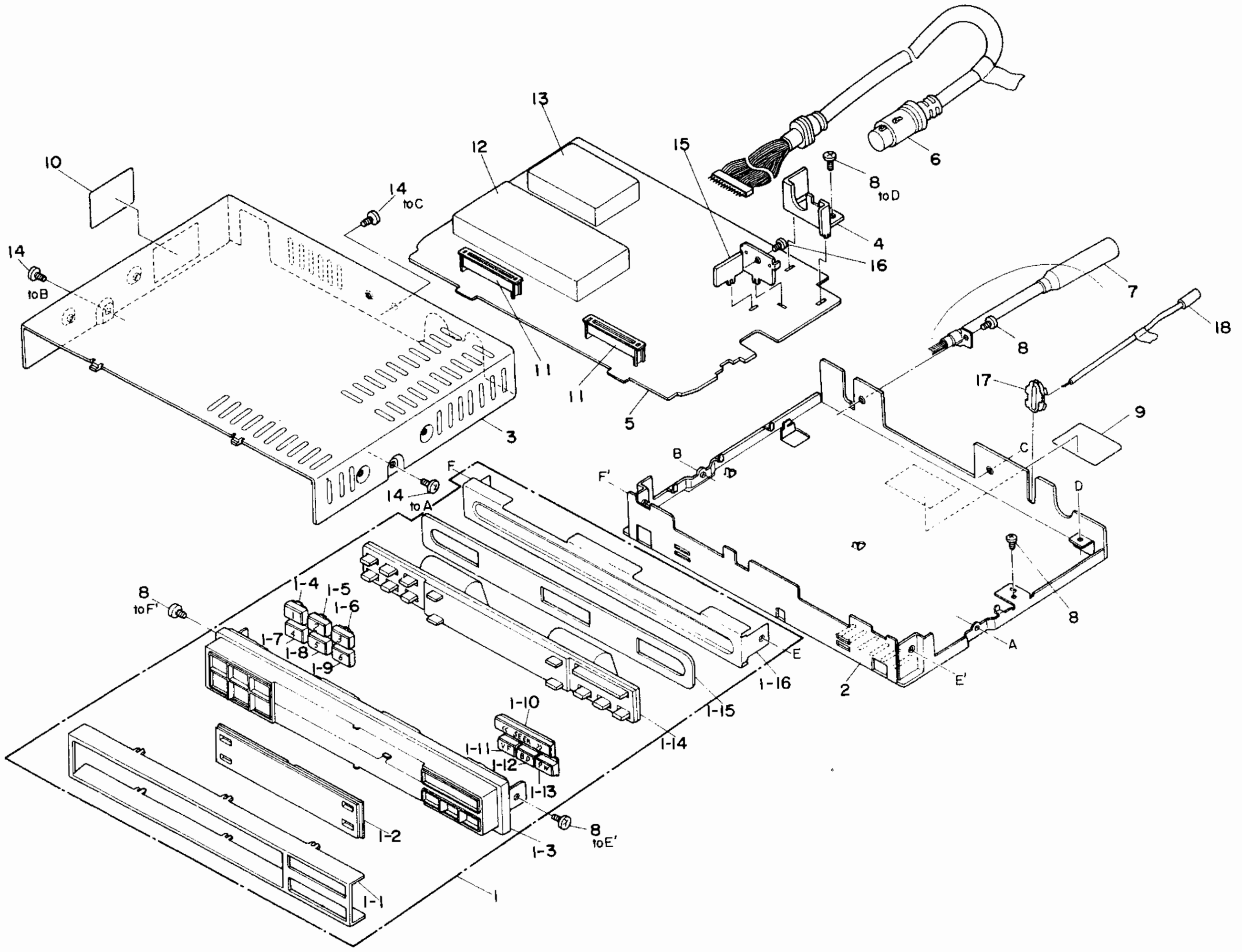
Absolute Maximum Ratings (Ta=25°C)

Input Voltage	V_{IN}	35V
Power Dissipation	P_D	800mW

Electrical Characteristics ($V_{IN}=11V$, $I_{OUT}=40mA$, $C_{IN}=0.33\mu F$, $C_{OUT}=0.1\mu F$, $T_j=0\sim125°C$)

			min	typ	max	
Output Voltage	V_{OUT}		5.76	6.0	6.24	V
Ripple Rejection Retio	RR	f=120Hz V_{IN}=9.0 19V	39	47		dB

■ EXPLODED VIEW • PARTS LIST:


13
12
15
10
14
to C
6
8
to D
14
to B
4
16
7
18
8
17
9
11
11
5
3
B
C
F'
F
14
to A
D
8
1-4
1-5
1-6
8
to F'
1-7
1-8
1-9
E
A
1-16
2
E'
1-15
1-10
1-14
1-11
1-12
1-13
8
to E'
1-2
1-3
1-1
1

Ref. No.	Part No. (Order No.)	Description	Q'ty
1	940-0618A	Escutcheon ass'y	1
1-1	370-3833-12	Escutcheon	1
1-2	373-0470-00	Dial cover	1
1-3	370-3831-01	Escutcheon	1
1-4	382-0877-00	Button (1)	1
1-5	382-0877-01	Button (2)	1
1-6	382-0877-02	Button (3)	1
1-7	382-0877-03	Button (4)	1
1-8	382-0877-04	Button (5)	1
1-9	382-0877-18	Button (6)	1
1-10	382-0879-04	Button (SEEK)	1
1-11	382-0878-12	Button (VF)	1
1-12	382-0878-13	Button (BD)	1
1-13	382-0878-08	Button (PW)	1
1-14	379-0123-00	Indicator	1
1-15	347-1891-00	Insulator	1
1-16	309-0546-00	Front plate	1
2	311-1243-00	Lower case	1
3	310-1279-00	Upper case	1
4	330-8283-00	Bracket	1
5	099-7786-00	P.W.B.	1
6	852-9265-00	Extension lead	1
7	092-0604-00	Antenna receptacle	1
8	731-3006-80	Taptight (M3X6)	5
9	286-5849-00	Set plate	1
10	285-1257-00	Guide label (8mm MAX)	1
11	074-0750-20	Outlet socket	2
12	941-0163-00	Tuner Pack (M/L)	1
13	880-1407B	Tuner Pack (FM)	1
14	731-3006-89	Tap tight (M3X6)	3
15	330-8218-00	IC-bracket	1
16	714-3003-81	Machine screw (3X3)	1
17	335-0580-00	Lead holder	1
18	852-8734-00	Extension lead (REMOCON)	1

■ PARTS LIST:

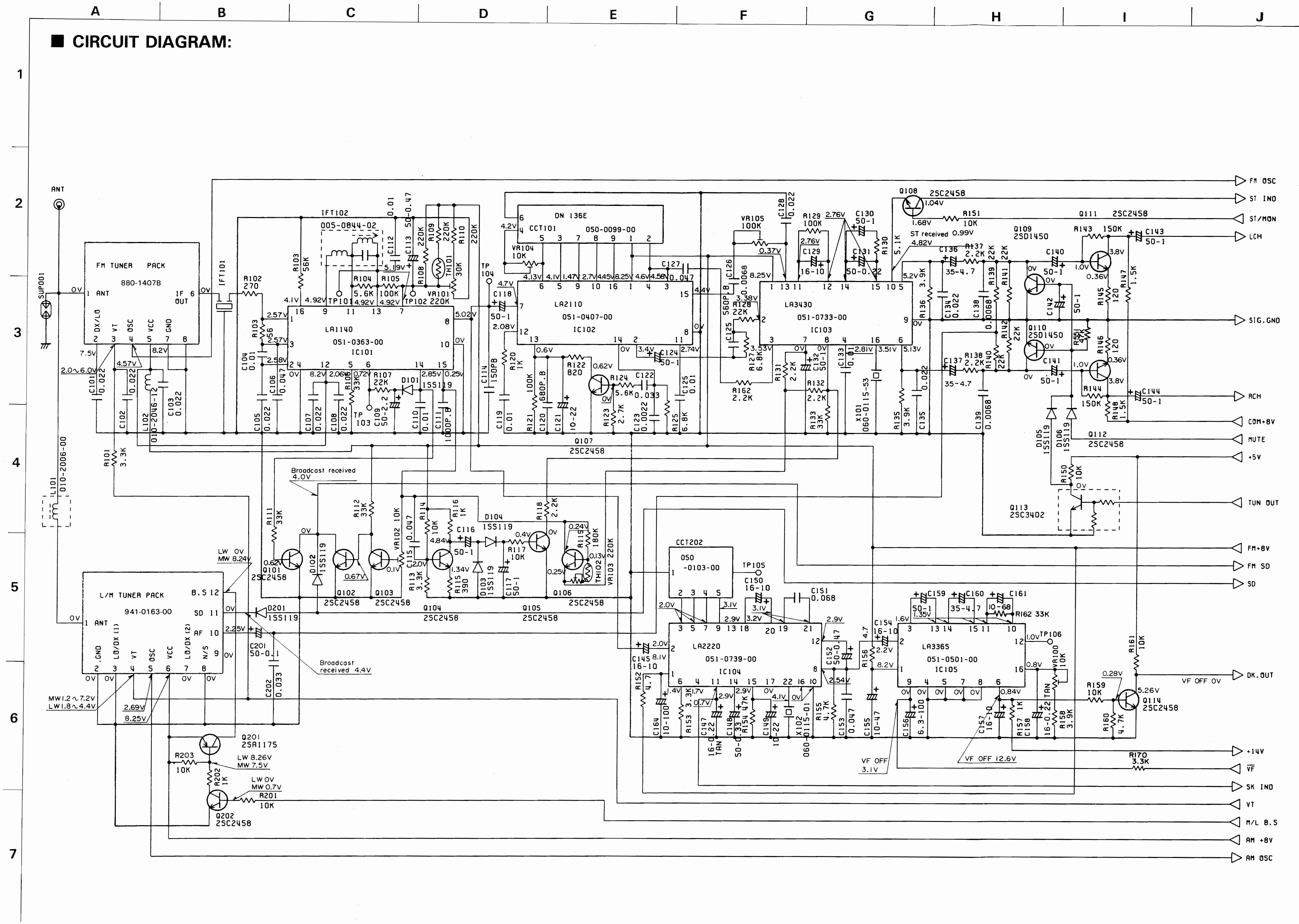
• Electrical section

Ref. No.	Part No. (Order No.)	Description	Q'ty
D101~106, 201, 401~404, 501~511, 701~703	001-0330-00	Diode (1SS119)	25
D512	001-0361-00	Diode (1SS198)	1
D704	001-0377-49	Diode (MA4100L)	1
TH101	002-0184-00	Thermistor (30k)	1
TH102	002-0193-00	Thermistor (3k)	1
IFT102	005-0844-02	IF-Transfomer	1
IFT101	005-0979-00	IF-Transfomer	1
L101	010-2006-00	Coil	1
L102	010-2046-12	Coil	1
VR100,102,104	012-3808-06	Variable resistor (10kΩ)	3
VR105	012-3808-10	Variable resistor (100kΩ)	1
VR101,103	012-3808-11	Variable resistor (220k)	2
R107	032-0059-05	Film resistor (22kΩ)	1
R105	032-0059-08	Film resistor (100kΩ)	1
R104	032-0059-49	Film resistor (5.6kΩ)	1
C147,158	042-0249-00	Tantalum capacitor (16V 0.22μF)	2
C703,750	042-0357-00	Electrolytic capacitor (16V 1000μF)	2
CCT501	050-0077-00	Component circuit (47kΩx4)	1
CCT101	050-0099-50	Component circuit	1
CCT202	050-0103-00	Component circuit	1
IC504	051-0281-01	IC (μPB553AC)	1
IC701	051-0296-01	IC (TA78L006AP)	1
IC502	051-0306-00	IC (TD62105P)	1
IC704	051-0352-00	IC (TA78L005P)	1
IC101	051-0363-00	IC (LA1140)	1
IC102	051-0407-00	IC (LA2110)	1
IC401	051-0450-00	IC (TA7555P)	1
IC505	051-0478-00	IC (NJD6506S)	1
IC105	051-0501-00	IC (LA3365)	1
IC503	051-0509-01	IC (μPD1710G013-03)	1
IC703	051-0526-00	IC (MB3756)	1
IC501	051-0565-00	IC (M54562P)	1
IC702	051-0624-00	IC (TA78L008AP)	1
IC103	051-0733-01	IC (LA3430)	1
IC104	051-0739-00	IC (LA2220)	1
X401	060-0071-00	Buzzer	1
X102	060-0115-01	Ceramic resonator	1
X101	060-0115-53	Ceramic resonator	1
SUP001	060-0122-00	Surge protector	1
X501	061-1037-00	Crystal (4.5MHz)	1
Q701	100-1020-00	Transistor (2SA1020)	1
Q102,501	100-1175-00	Transistor (2SA1175)	2

Ref. No.	Part No. (Order No.)	Description	Q'ty
Q506,507	102-2458-28	Transistor (2SC2458GR)	2
Q101~108, 111, 112,114,202, 401~406, 502~505,702, 703	102-2458-49	Transistor (2SC2458YGR)	24
Q113	102-3402-00	Transistor (2SC3402)	1
Q109,110	103-1450-00	Transistor (2SD1450)	2
R706	114-3301-31	Film resistor (3W 33Ω) OM	1
C111,405,506	160-1022-05	Ceramic capacitor (1000pF B) HD	3
C114	160-1512-05	Ceramic capacitor (150pF B) HD	1
C125	160-5612-05	Ceramic capacitor (560pF B) HD	1
C120	160-6812-05	Ceramic capacitor (680pF B) HD	1
C104,110,112, 119,125,133, 406,511	171-1033-06	Ceramic capacitor (0.01μF) SC	8
C123	171-2223-06	Ceramic capacitor (0.0022μF) SC	1
C101,102, 103,105,107, 108,128,134, 135,503,507	171-2233-06	Ceramic capacitor (0.022μF) SC	11
C122,202	171-3333-06	Ceramic capacitor (0.033μF) SC	2
C106,115,127, 153,708,712	171-4733-06	Ceramic capacitor (0.047μF) SC	6
C126,138,139	171-6823-06	Ceramic capacitor (0.0068μF) SC	3
C151	171-6833-06	Ceramic capacitor (0.068μF)SC	1
C713	172-1042-20	Polyester capacitor (63V 0.1μF) SS	1
C201,513,701, 702,706,707	173-1042-10	Polyester capacitor (50V 0.1μF) S	6
C501,502	174-2200-13	Ceramic capacitor (22pF CH) TC	2
C711	179-2273-23	Electrolytic capacitor (10V 220μF) S	1
C403,504	179-4773-23	Electrolytic capacitor (10V 470μF) S	2
C116~118,124, 130,132, 140~144,159, 710	182-1053-62	Electrolytic capacitor (50V 1μF) SS	13
C129,145,150, 154,157,404, 505,508,709, 714	182-1063-32	Electrolytic capacitor (16V 10μF) SS	10
C156	182-1073-12	Electrolytic capacitor (6.3V 100μF) SS	1
C164	182-1073-22	Electrolytic capacitor (10V 100μF) SS	1
C131	182-2243-62	Electrolytic capacitor (50V 0.22μF) SS	1
C109,510	182-2253-62	Electrolytic capacitor (50V 2.2μF) SS	2
C121,149	182-2263-22	Electrolytic capacitor (10V 22μF) SS	2
C148,509	182-3343-62	Electrolytic capacitor (50V 0.33μF) SS	2
C512	182-3353-62	Electrolytic capacitor (50V 3.3μF) SS	1
C402	182-3363-22	Electrolytic capacitor (10V 33μF) SS	1
C113,152	182-4743-62	Electrolytic capacitor (50V 0.47μF) SS	2
C136,137, 160,401	182-4753-52	Electrolytic capacitor (35V 4.7μF) SS	4
C155	182-4763-22	Electrolytic capacitor (10V 47μF) SS	1
C704,705	182-4763-32	Electrolytic capacitor (16V 47μF) SS	2
C161	183-6863-22	Electorlytic capacitor (10V 68μF) USS	1

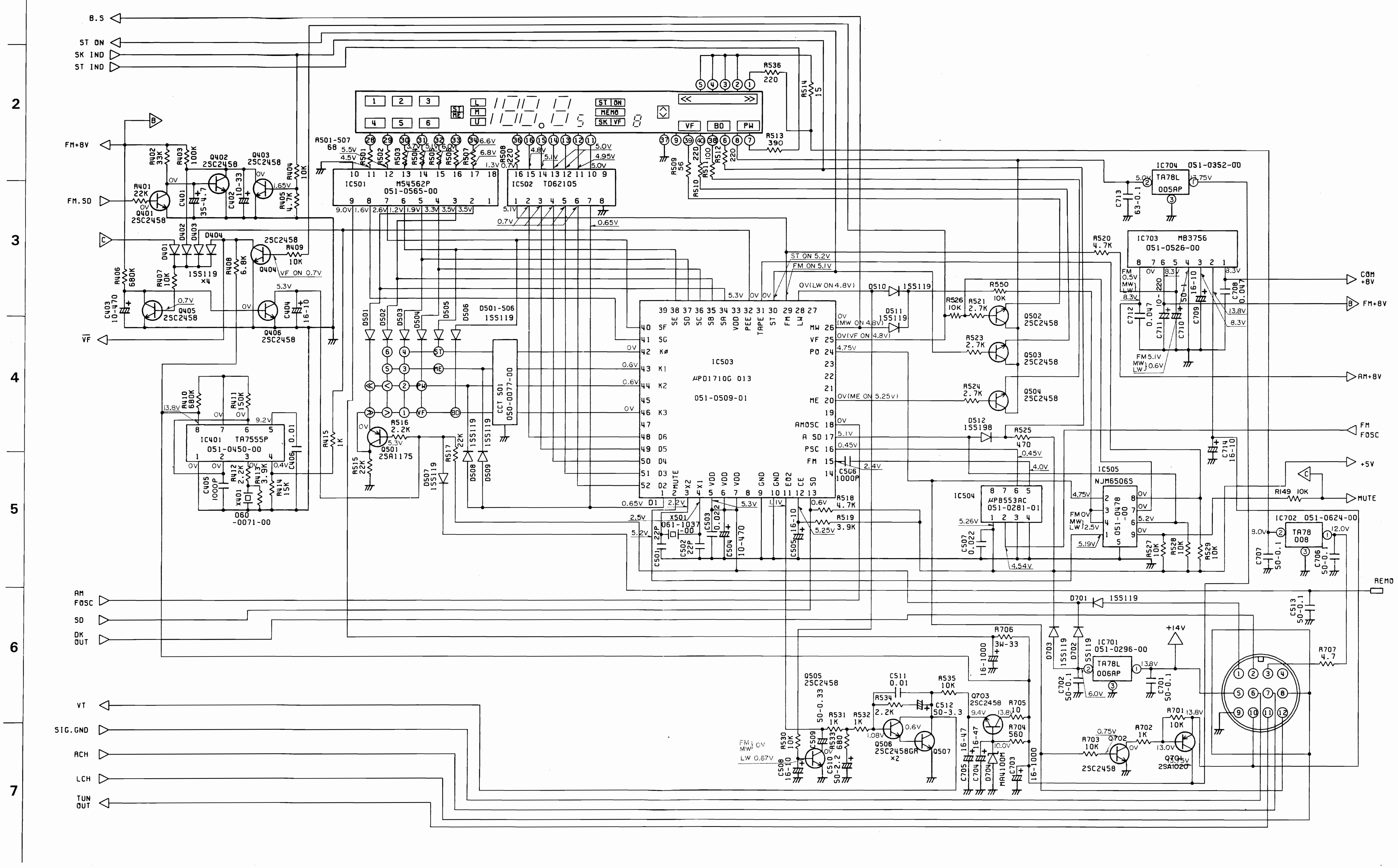
Notes: OM (Oxidized Metal)
S (Small)
HD (Higher Dielectric)
SC (Semi Conductor)
SS (Super Small)
TC (Temperature Compensating)
LL (Low Leak)
USS(Ultra Super Small)

■ CIRCUIT DIAGRAM:

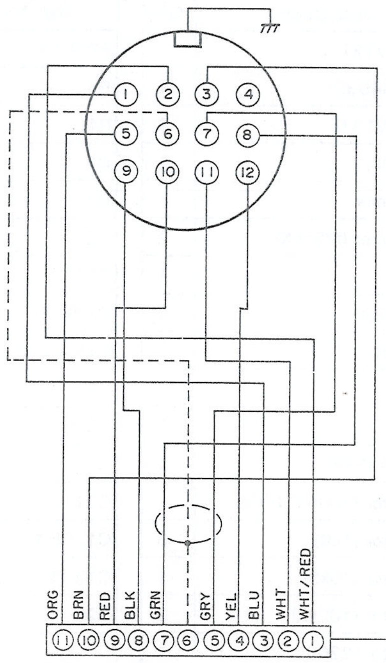

A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
ANT
SUP001
FM TUNER PACK
880-1407B
ANT
IF OUT
DX/LO
VT
OSC
VCC
GND
IFT101
IFT102
005-0844-02
LA1140
051-0363-00
IC101
TP101
TP102
TP103
TP104
TP105
TP106
DN 136E
CCT101
050-0099-00
VR104 10K
LA2110
051-0407-00
IC102
VR105 100K
LA3430
051-0733-00
IC103
X101
060-0115-53
Q107
2SC2458
Q108
2SC2458
ST received 0.99V
Q109
2SD1450
Q110
2SD1450
Q111
2SC2458
Q112
2SC2458
Q113
2SC3402
D105
1SS119
D106
1SS119
L101
010-2006-00
L102
010-2046-12
Broadcast received 4.0V
Q101
2SC2458
Q102
2SC2458
Q103
2SC2458
Q104
2SC2458
Q105
2SC2458
Q106
2SC2458
D101
1SS119
D102
1SS119
D103
1SS119
D104
1SS119
VR101 220K
VR102 10K
VR103 220K
TH101
TH102
L/M TUNER PACK
941-0163-00
B.S
SD
AF
LO/DX (1)
LO/DX (2)
N/S
LW 0V
MW 8.24V
D201
1SS119
Broadcast received 4.4V
MW1.2～7.2V
LW1.8～4.4V
Q201
2SA1175
LW 8.26V
MW 7.5V
Q202
2SC2458
LW 0V
MW 0.7V
R201 10K
R202 1K
R203 10K
CCT202
050
-0103-00
LA2220
051-0739-00
IC104
X102
060-0115-01
LA3365
051-0501-00
IC105
VR100 10K
Q114
2SC2458
VF OFF 0V
VF OFF 3.1V
VF OFF 12.6V
R170 3.3K
R161 10K
FM OSC
ST IND
ST/MON
LCH
SIG.GND
RCH
COM+8V
MUTE
+5V
TUN OUT
FM+8V
FM SD
SD
DK.OUT
+14V
VF
SK IND
VT
M/L B.S
AM +8V
AM OSC

900TX

■ CIRCUIT DIAGRAM:


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
B.S
ST ON
SK IND
ST IND
FM+8V
FM.SD
VF
AM FOSC
SD
DK OUT
VT
SIG.GND
RCH
LCH
TUN OUT
COM +8V
FM+8V
AM+8V
FM FOSC
+5V
MUTE
REMO
+14V
R402 33K
R403 100K
Q402 2SC2458
Q403 2SC2458
R404 10K
R401 22K
Q401 2SC2458
C401 35-4.7
C402 10-33
R405 4.7K
D401 D402 D403 D404 1SS119 ×4
R409 10K
Q404
VF ON 0.7V
R406 680K
R407 10K
R408 6.8K
C403 10-470
Q405 2SC2458
Q406 2SC2458
C404 16-10
R410 680K
R411 150K
IC401 TA7555P 051-0450-00
C405 1000P
X401 060-0071-00
R412 2.2K
R413 3.9K
R414 15K
C406 0.01
R415 1K
R501-507 68
IC501 M54562P 051-0565-00
R508 220
IC502 TD62105
D501 D502 D503 D504 D505 D506
D501-506 1SS119
CCT 501 050-0077-00
R516 2.2K
Q501 2SA1175
R515 22K
R517 22K
D507 1SS119
D508 1SS119
D509 1SS119
ST ON
MEMO
SK VF
VF
BD
PW
R536 220
R514 15
R513 390
R509 56
R510
R511 100
R512 220
IC503
µPD1710G 013
051-0509-01
ST ON 5.2V
FM ON 5.1V
OV(LW ON 4.8V)
OV(MW ON 4.8V)
OV(VF ON 4.8V)
OV(ME ON 5.25V)
X501 061-1037-00
C501 22P
C502 22P
C503 0.022
C504 10-470
C505 16-10
C506 1000P
R518 4.7K
R519 3.9K
D510 1SS119
D511 1SS119
R526 10K
R521 2.7K
R550 10K
Q502 2SC2458
R523 2.7K
Q503 2SC2458
R524 2.7K
Q504 2SC2458
D512 1SS198
R525 470
IC504 µPB553AC 051-0281-01
C507 0.022
IC505 NJM6506S 051-0478-00
R527 10K
R528 10K
R529 10K
IC704 051-0352-00 TA78L 005AP
C713 63-0.1
R520 4.7K
IC703 MB3756 051-0526-00
C712 0.047
C711 10-220
C710 50-1
C709 16-10
C708 0.047
C714 16-10
R149 10K
IC702 051-0624-00 TA78 008
C707 50-0.1
C706 50-0.1
C513 50-0.1
D701 1SS119
D703 1SS119
D702 1SS119
IC701 051-0296-00 TA78L 006AP
C702 50-0.1
C701 50-0.1
R706 3W-33
16-1000
Q505 2SC2458
C511 0.01
R535 10K
R534 2.2K
C512 50-3.3
Q703 2SC2458
R705 10
R531 1K
R532 1K
R530 10K
C509 50-0.33
R533 680
C510 50-2.2
C508 16-10
Q506 2SC2458GR ×2
Q507
C705 16-47
C704 16-47
D704 MA4100M
R704 560
C703 16-1000
R703 10K
Q702 2SC2458
R702 1K
R701 10K
Q701 2SA1020
R707 4.7

■ PRINTED WIRING BOARD:

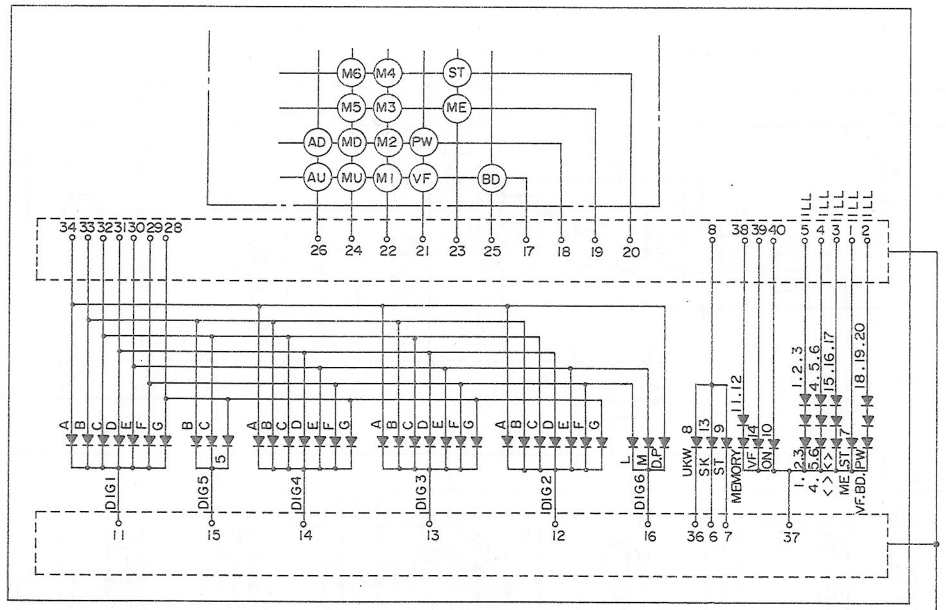


ORG
BRN
RED
BLK
GRN
GRY
YEL
BLU
WHT
WHT/RED

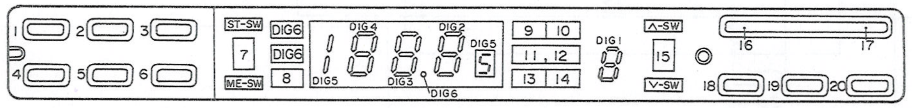
DIN CONNECTOR

Pin No	Connect
Chassis	Shield
1	Back up
2	DK out
3	Illumination
4	
5	Acc
6	Sig Gnd
7	Right
8	Left
9	Gnd
10	+B
11	Tun out
12	Tun in

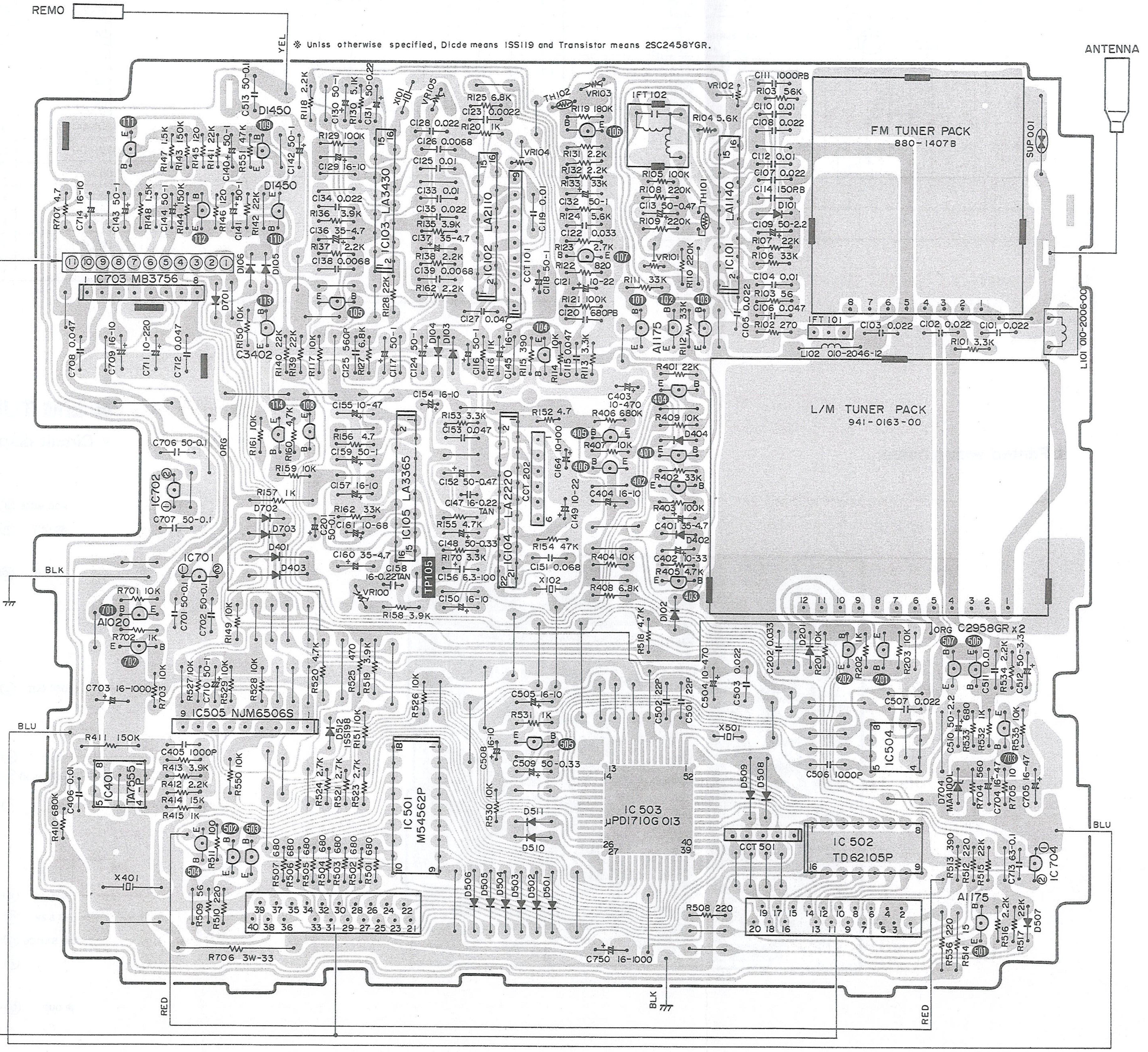
Color	LED No.
ORG (HS)	DIG 1~6 8, 11~14
RED (HD)	9, 10
YEL (HY)	1~7 15~20



M6
M4
ST
M5
M3
ME
AD
MD
M2
PW
AU
MU
M1
VF
BD
DIG1
DIG5
DIG4
DIG3
DIG2
DIG6
UKW
SK
ST
MEMORY
VF
ON
1.2.3
4.5.6
15.16.17
18.19.20



ST-SW
DIG6
ME-SW
DIG4
DIG2
DIG5
DIG3
DIG1
DIG6
Λ-SW
V-SW

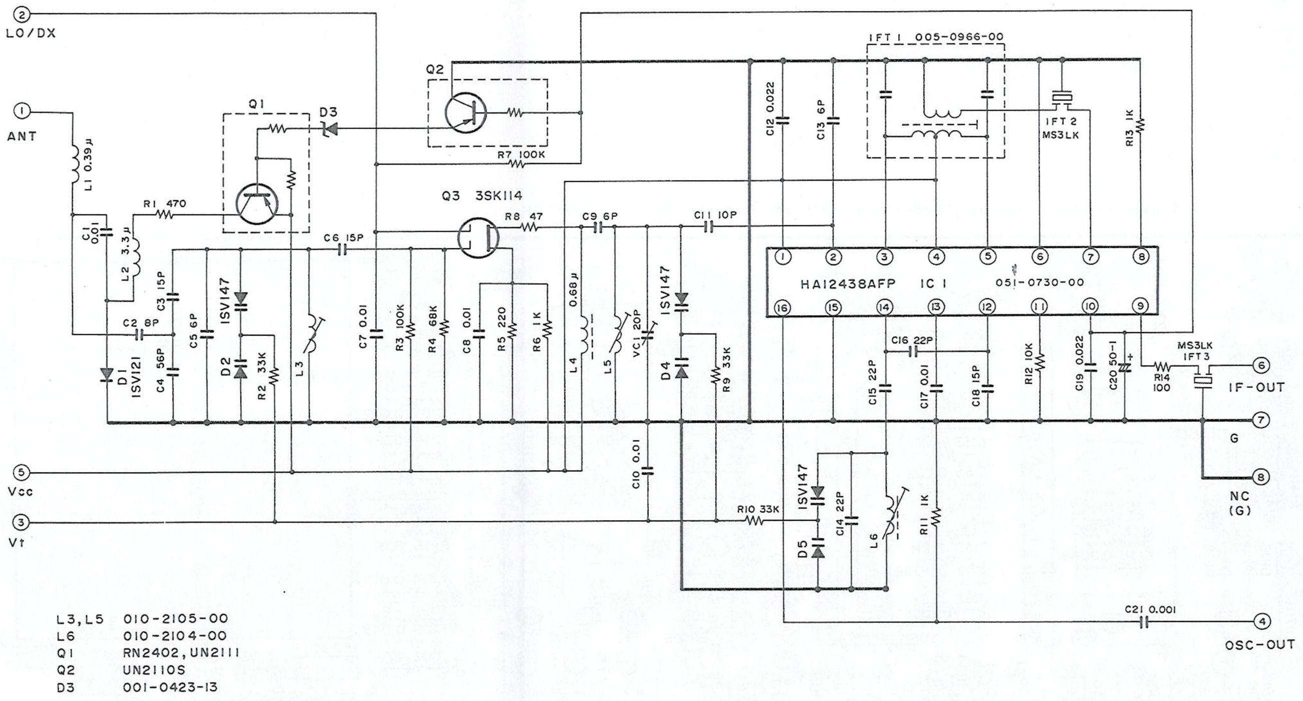


REMO
YEL
ANTENNA
FM TUNER PACK
880-14078
L/M TUNER PACK
941-0163-00
IC703 MB3756
IC101 LA1140
IC102 LA2110
IC103 LA3430
IC104 LA2220
IC105 LA3365
IC401 TA7555
IC501 M54562P
IC502 TD62105P
IC503 μPD1710G 013
IC504
IC505 NJM6506S
IC701
IC702
IC704
C2958GR x2
A1175
A1020
C3402
D1450
TP105
IFT102
IFT101
L101 010-2006-00
L102 010-2046-12
SUP001
R706 3W-33
C750 16-1000
BLK
BLU
RED
ORG

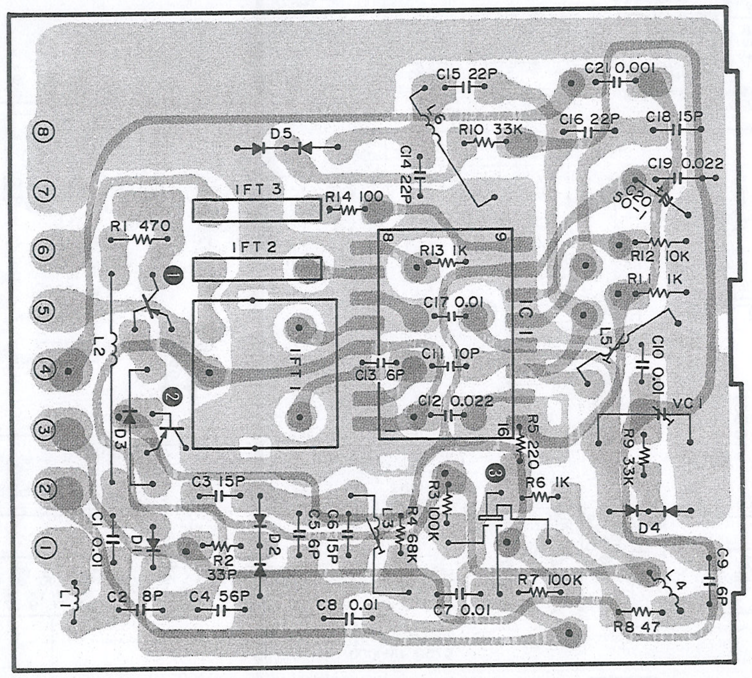
※ Unlss otherwise specified, Dicde means 1SS119 and Transistor means 2SC2458YGR.

FM TUNER PACK: 880-1407B

Circuit diagram


LO/DX
ANT
Vcc
Vt
IF-OUT
G
NC (G)
OSC-OUT
IFT1 005-0966-00
IFT2 MS3LK
MS3LK IFT3
HA12438AFP IC1 051-0730-00
Q1
Q2
Q3 3SK114
R7 100K
R8 47
R1 470
C6 15P
C9 6P
C11 10P
C21 0.001
L3,L5 010-2105-00
L6 010-2104-00
Q1 RN2402, UN2111
Q2 UN2110S
D3 001-0423-13

Printed wiring board:

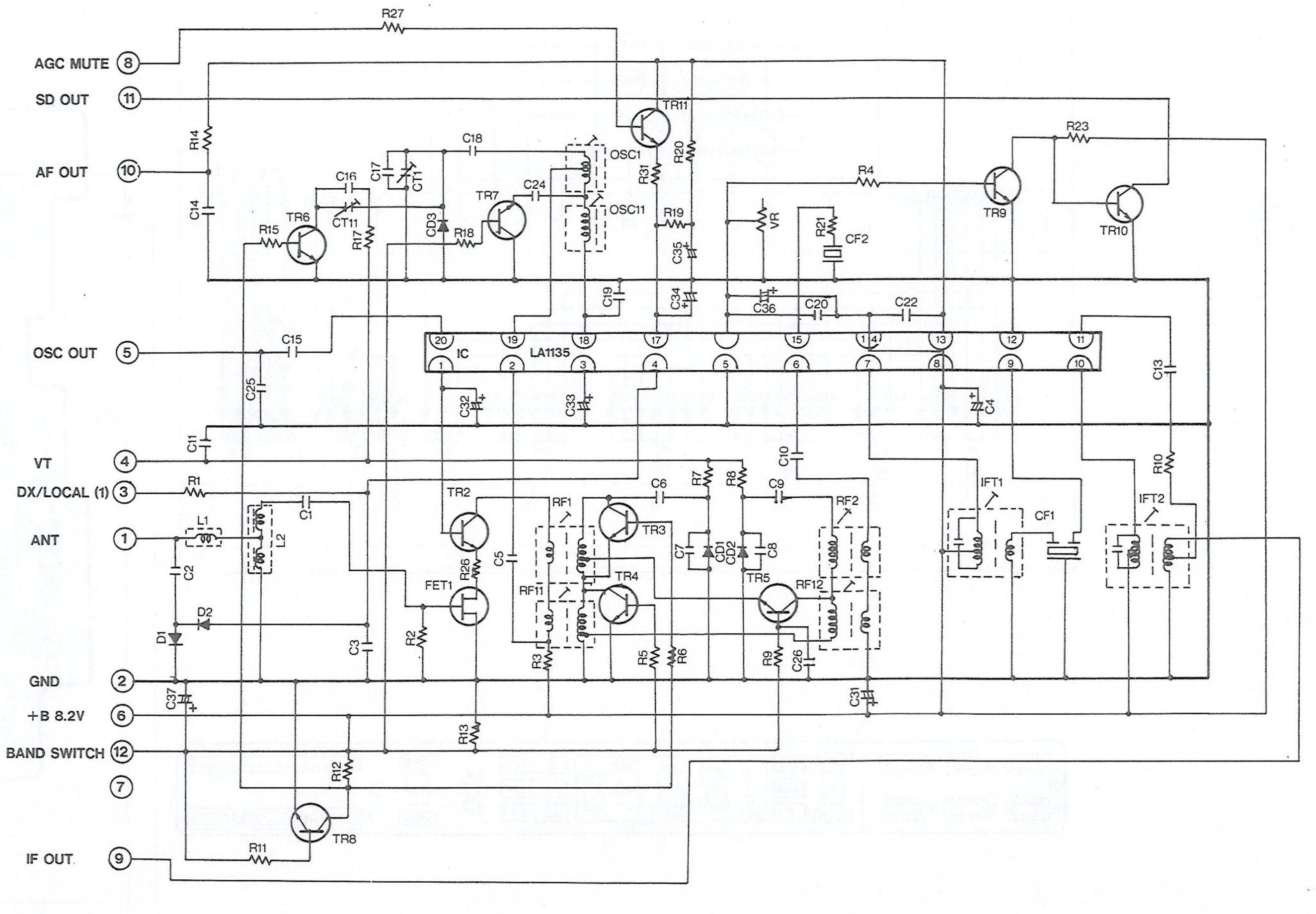

IFT 3
IFT 2
IFT 1
IC
C15 22P
C21 0.001
C16 22P
C18 15P
C19 0.022
R10 33K
R14 100
R13 1K
R12 10K
R11 1K
C17 0.01
C11 10P
C12 0.022
C13 6P
C10 0.01
VC1
R9 33K
R6 1K
R5 220
R4 68K
R3 100K
R7 100K
R8 47
R1 470
R2 33P
C3 15P
C4 56P
C2 8P
C5 6P
C6 15P
C7 0.01
C8 0.01
C1 0.01
C9 6P
D1
D2
D3
D4
D5
L1
L2
L4
L5
L6

Electrical section

Ref. No.	Part No. (Order No.)	Description	Q'ty
D1	001-0368-00	Diode (1SV121)	1
D3	001-0423-13	Diode (MA4033)	1
D2,4,5	001-0442-00	Diode (1SV147)	3
VC1	004-1567-00	Trimer (20P)	1
IFT1	005-0966-00	IF-Transfomer	1
IFT2,3	005-0967-00	IF-Transfomer (MS3LK)	2
L4	010-1570-01	Coil (RF)	1
L1	010-2046-03	Coil (0.039μH)	1
L2	010-2046-14	Coil (3.3μH)	1
L6	010-2104-00	Coil (OSC)	1
L3,5	010-2105-00	Coil (L4.5T)	2
IC1	051-0730-00	IC (HA12438FP)	1
R14	117-1011-10	Chip resistor (1/16W 100Ω)	
R6,11,13	117-1021-10	Chip resistor (1kΩ)	3
R12	117-1031-10	Chip resistor (10kΩ)	1
R3,7	117-1041-10	Chip resistor (100kΩ)	2
R5	117-2211-10	Chip resistor (220Ω)	1
R2,9,10	117-3331-10	Chip resistor (33kΩ)	3
R8	117-4701-10	Chip resistor (47Ω)	1
R4	117-6831-10	Chip resistor (68Ω)	1
Q3	124-0114-15	Transistor (3SK114)	1
Q1	125-0001-01	Transistor (UN2111)	1
Q2	125-0006-00	Transistor (UN2110)	1
C11	176-1007-00	Ceramic chip capacitor (10pF)	1
C3,6,18	176-1501-00	Ceramic chip capacitor (15pF)	3
C14,15,16	176-2201-00	Ceramic chip capacitor (22pF)	3
C4	176-5601-00	Ceramic chip capacitor (56pF)	1
C5,9,13	176-6097-00	Ceramic chip capacitor (6pF)	3
C2	176-8097-00	Ceramic chip capacitor (8pF)	1
C21	178-1022-05	eramic chip capacitor (0.001μF)	1
C1,7,8,10,17	178-1032-05	Ceramic chip capacitor (0.01μF)	5
C12,19	178-2232-05	Ceramic chip capacitor (0.022μF)	2
C20	183-1053-62	Electrolytic capacitor (50V 1μF)	1

L/M TUNER PACK: 941-0163-00

Circuit diagram


AGC MUTE ⑧
SD OUT ⑪
AF OUT ⑩
OSC OUT ⑤
VT ④
DX/LOCAL (1) ③
ANT ①
GND ②
+B 8.2V ⑥
BAND SWITCH ⑫
⑦
IF OUT ⑨
IC LA1135
TR1
TR2
TR3
TR4
TR5
TR6
TR7
TR8
TR9
TR10
FET1
OSC1
OSC11
RF1
RF11
RF2
RF12
IFT1
IFT2
CF1
CF2
VR
L1
L2
D1
D2
CD1
CD2
CD3
CT1
CT11
R27
R23
R4
R20
R21
R19
R14
R15
R17
R18
R1
R2
R3
R5
R6
R7
R8
R9
R10
R11
R12
R13
R26
C1
C2
C3
C5
C6
C7
C8
C9
C10
C11
C13
C14
C15
C16
C17
C18
C19
C20
C22
C24
C25
C26
C31
C32
C33
C34
C35
C36
C37

Printed in Japan 298-3414-00 MAR. 1986 Ⓣ